

What is claimed is:

1. A system for processing an input signal, the system comprising:
 - an adaptive predistortion subsystem for receiving said input signal and for producing a predistorted signal by applying a deliberate predistortion to said input signal; and
 - a signal processing subsystem receiving and processing said predistorted signal and producing a system output signal,wherein
 - said predistortion subsystem distorts said input signal to compensate for distortions in said system output signal;
 - said signal processing subsystem decomposes said predistorted signal into separate components, each of said separate components being processed separately;
 - said processing subsystem combines said components after processing to produce said system output signal; and
 - said deliberate predistortion applied to said input signal by said adaptive predistortion subsystem to produce said predistorted signal is adjusted based on characteristics of said system output signal and said input signal.
2. A system according to claim 1 wherein said signal processing subsystem comprises:
 - a signal decomposer for decomposing said predistorted signal into at least two components;
 - at least two signal component processor blocks, each signal processor block receiving an output of said signal decomposer and each signal processor block separately processes said output received from said signal decomposer; and
 - a combiner receiving a processed output from each of said at least two signal component processor blocks, said combiner producing said system output signal from said processed outputs of said at least two signal component processor blocks..

3. A system according to claim 2 wherein at least one of said at least two signal component processor blocks includes an amplifier.
4. A system according to claim 3 wherein said amplifier is a non-linear amplifier.
5. A system according to claim 1 wherein said system is part of a signal transmission system.
6. A system according to claim 1 wherein at least some of said distortions are due to said combiner.
7. A system according to claim 3 wherein said amplifier is a switch mode amplifier.
8. A system according to claim 3 wherein said amplifier has a low output impedance.
9. A system according to claim 1 wherein said deliberate predistortion includes magnitude distortions which adjust a magnitude of said input signal.
10. A system according to claim 1 wherein said deliberate predistortion includes phase distortions which adjust a phase of said input signal.
11. A system according to claim 1 wherein said deliberate predistortion is based on at least one entry in a lookup table.
12. A method of processing an input signal to produce a system output signal, the method comprising:
 - a) receiving said input signal;
 - b) applying a deliberate predistortion to said input signal to result in a predistorted signal;
 - c) decomposing said predistorted signal into at least two component signals;

- d) combining said at least two component signals to produce said system output signal;
 - e) adjusting said deliberate predistortion based on said characteristics of said system output signal.
13. A method according to claim 12 wherein said system output signal is an RF modulated version of said input signal.
14. A method according to claim 12 further including a processing step of separately processing each of said at least two component signals prior to step d).
15. A method according to claim 14 wherein said processing step includes amplifying at least one of said at least two component signals.
16. A method according to claim 14 wherein said processing step includes phase modulating at least one of said at least two component signals.
17. A method according to claim 12 wherein step a) further includes the step of accessing an entry in a lookup table, said deliberate predistortion being based on said entry.
18. A method according to claim 17 wherein said deliberate predistortion is based on an interpolation of entries in said table.
19. A system according to claim 1 wherein said predistortion subsystem receives a replica of said system output signal.
20. A system according to claim 2 wherein said deliberate predistortion is dependent on differences between said input signal and said replica of said system output signal.
21. A system according to claim 11 wherein entries in said lookup table are periodically

updated based on characteristics of a replica of said system output signal.

22. A system according to claim 11 wherein said deliberate predistortion is based on an interpolation of entries in said table.
23. A system according to claim 1 wherein said predistortion subsystem includes:
- determining means for determining said deliberate predistortion;
 - adjustment means for applying said deliberate predistortion to said input signal;
 - update means for periodically updating said determining means based on characteristics of said system output signal.
24. A system according to claim 23 wherein said adjustment means receives parameters of said deliberate predistortion from said determining means.
25. A method according to claim 12 further including the step of taking a difference between said input signal and a replica of said system output signal to determine said characteristics of said system output signal.
26. A method according to claim 17 further including the step of updating at least one entry in said table.
27. An adaptive predistortion subsystem for use with a signal processing system which produces a system output signal, the predistortion subsystem comprising:
- determining means for determining a deliberate predistortion to be applied to an input signal;
 - adjustment means for applying said deliberate predistortion to said input signal;
 - update means for periodically updating said determining means based on characteristics of said system output signal.

28. An adaptive predistortion subsystem according to claim 27 wherein said adjustment means receives parameters of said deliberate predistortion from said determining means.
29. An adaptive predistortion subsystem according to claim 27 wherein said determining means comprises a lookup table having entries, said entries being used to determine said deliberate predistortion.
30. An adaptive predistortion subsystem according to claim 29 wherein said determining means further comprises interpolating means for determining values not found in said lookup table.
31. An adaptive predistortion subsystem according to claim 27 wherein said deliberate predistortion is dependent on differences between said input signal and said replica of said system output signal.
32. A method according to claim 12 wherein said deliberate predistortion is at least partially based on characteristics of said system output signal.
33. A method according to claim 32 wherein said deliberate predistortion is determined in an iterative manner during transmission of said system output signal.